WHAT IS CLAIMED IS:

1. A method of manufacturing optical devices comprising:

providing a substrate; and

forming at least one optical layer on said substrate by a CVD process including at least one deuterated source gas.

2. The method of claim 1, wherein the deuterated source gas is selected from the group consisting of deuterated ammonia, deuterated silane, deuterated disilane and deuterated germane.

3. The method of claim 2, wherein the source gas is partially deuterated.

4. The method of claim 1, wherein the CVD process is selected from the group consisting of APCVD, LPCVD and PECVD.

5. The method of claim 1, wherein said step of forming at least one optical layer includes forming an optical layer with a wavelength of an overtone about 2004 nm.

6. The method of claim 1, wherein said step of forming at least one optical layer includes forming an optical layer with an index of refraction between 1.45 and 2.2.

7. The method of claim 6, wherein said step of forming at least one optical layer includes forming an optical layer with an index of refraction between 1.6 and 1.8.

8. The method of claim 1, wherein said step of forming at least one optical layer includes forming a layer of silicon oxynitride.

9. The method of claim 1, wherein said step of forming at least one optical layer includes forming a layer of germanium doped silicon oxynitride.

10. The method of claim 1, wherein said optical layer exhibits propagation losses below 4 dB/cm.

11. The method of claim 1, wherein said optical layer exhibits propagation losses below 0.2 dB/cm.

12. The method of claim 8, wherein said optical layer exhibits propagation losses below 4 dB/cm.

13. The method of claim 8, wherein said optical layer exhibits propagation losses below 0.2 dB/cm.

14. The method of claim 8, further comprising:

forming a cladding layer.

15. The method of claim 14, wherein said cladding layer comprises silicon oxynitride, deuterated silicon oxynitride or deuterated germanium doped silicon oxynitride.

16. The method of claim 14, further comprising:

forming a buffer layer.

17. The method of claim 16, wherein said buffer layer is either silicon oxynitride, deuterated silicon oxynitride or deuterated germanium doped silicon oxynitride.

18. The method of claim 16, wherein the buffer layer is selected from the group consisting of FSG, PSG and BPSG.

19. An optical device comprising:

a substrate; and

an inorganic optical layer comprising deuterium,

wherein the inorganic optical layer comprises deuterated silicon oxynitride and the inorganic optical layer exhibits propagation losses below 4 dB/cm.

20. The optical device of claim 19, wherein the optical layer comprises deuterated germanium doped silicon oxynitride.

21. The optical device of claim 19, wherein the device further comprises a cladding layer.

22. The optical device of claim 21, wherein the cladding layer comprises silicon oxynitride.

23. The optical device of claim 21, wherein the cladding layer comprises deuterated germanium doped silicon oxynitride.

24. The optical device of claim 23, wherein the device further comprises a buffer layer.

25. The optical device of claim 24, wherein the buffer layer comprises deuterated germanium doped silicon oxynitride.

26. The optical device of claim 24, wherein the buffer layer is selected from the group consisting of FSG, PSG and BPSG.

27. The optical device of claim 19, wherein the wavelength of an overtone in the patterned optical layer is about 2004 nm.

28. The optical device of claim 19, wherein said optical layer exhibits propagation losses below 0.2 dB/cm.

29. The optical device of claim 23, wherein said optical layer exhibits propagation losses below 4 dB/cm.

30. The optical device of claim 23, wherein said optical layer exhibits propagation losses below 0.2 dB/cm.

31. The optical device of claim 23, wherein said optical layer exhibits an index of refraction between 1.45 and 2.2.

32. The optical device of claim 23, wherein said optical layer exhibits an index of refraction between 1.6 and 1.8.

33. The optical device of claim 19, wherein said optical device is chosen from the group consisting of an optical waveguide, an arrayed waveguide, a wavelength demultiplexer, a power splitter, an optical coupler, a phaser, and a variable optical attenuator.

34. An optical device comprising:

a substrate;

an inorganic optical layer comprising deuterium; and

a silicon oxynitride buffer layer between the substrate and the optical layer,

wherein the inorganic optical layer comprises deuterated silicon oxynitride and the inorganic optical layer exhibits propagation losses below 4 dB/cm.